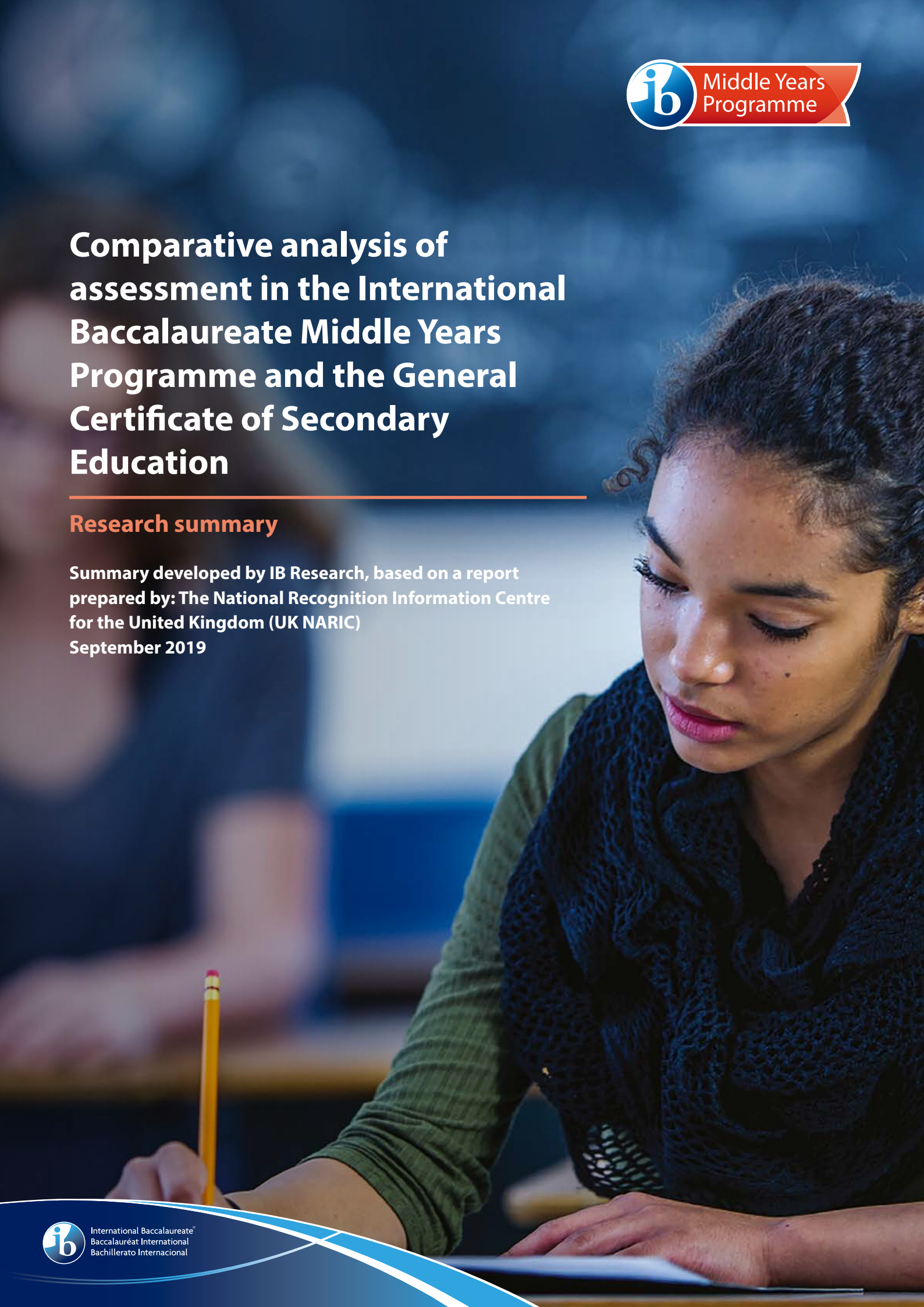


Middle Years Programme

Comparative analysis of assessment in the International Baccalaureate Middle Years Programme and the General Certificate of Secondary Education

Research summary

Summary developed by IB Research, based on a report prepared by: The National Recognition Information Centre for the United Kingdom (UK NARIC)

September 2019

International Baccalaureate®
Baccalauréat International
Bachillerato Internacional

Key findings

- Independent comparative analysis of the assessments of the International Baccalaureate (IB) Middle Years Programme (MYP) and the General Certificate of Secondary Education (GCSE) found the two qualifications to be comparable.
- Analysis of the MYP and GCSE in the four subjects examined in this study (English, mathematics, physics and integrated/combined sciences) found clear comparability in terms of the level and range of skills assessed.
- While the MYP places slightly more emphasis on depth and the GCSE on breadth, the content studied is generally similar.
- Although the specific ways in which they place demand on students differ, overall, the assessments can be considered comparable in terms of cognitive demand.

Background

The MYP, a baccalaureate-style programme designed for learners aged 11–16, aims to prepare students for upper secondary education or further study. With a similar educational aim, the United Kingdom's GCSE is a two-year single subject qualification for students aged 14–16.

Given recent educational reforms to the GCSE as well as the introduction of the MYP eAssessment in 2016, a study to establish the comparability of the MYP and the GCSE is timely. This study compares assessment in the MYP and GCSE with a focus on four subjects: English, mathematics, physics and integrated/combined sciences. The comparative analysis explores the aims, assessment objectives and assessment methods of the MYP and GCSE in these chosen subjects. The study also examines the cognitive demand of MYP and GCSE assessments.

Research methods

The study methodology included three stages, which are summarized below. To learn more about the methods employed in this study, see the full research report.

1. **Review:** The study began with a review of MYP documentation to understand the programme and selected subjects to support the selection of similarly-focused GCSE subjects. For both MYP and GCSE subjects, researchers reviewed subject specifications, examination papers and associated mark schemes. Table 1 displays the subjects examined in the comparative analysis.
2. **Comparative analysis:** The comparative analysis focused on examining MYP and GCSE selected subjects both in terms of their assessment frameworks and their cognitive demand. Using the well-regarded CRAS framework (Pollitt et al 2007)[1], cognitive demand analysis was conducted by a team of analysts at UK NARIC, experienced in benchmarking international secondary qualifications, together with 16 external consultants who were secondary school teachers in the UK, experienced in teaching at GCSE level in their respective subject. The external consultants were familiar with the GCSE but were not MYP teachers or examiners. Each external consultant was provided with anonymized copies of the relevant MYP and GCSE examinations so that they were not made aware which items came from the MYP and which were drawn from the GCSE.
3. **Evaluation and synthesis:** During this stage, researchers synthesized the findings of the review from the qualification specifications, assessment objectives, assessment methods, item analysis and mark scheme comparisons.

MYP	GCSE
English language and literature	English language
Mathematics (standard and extended)	Mathematics
Sciences (integrated)	Combined science: synergy
Physics	Physics

Table 1. Subjects selected for analysis

[1]This study was informed by the CRAS scales, which is a qualitative framework aimed at conceptualizing examination question demand.

Findings

Overall findings

This in-depth analysis found the two qualifications, the MYP and the GCSE, to be comparable. While there are some notable differences in the two qualifications, these principally relate to the duration and volume of assessment. Some minor differences were seen in the breadth and depth of content assessed, with the GCSE placing slightly more emphasis on breadth, and the MYP on depth. The overall content studied, however, is similar. In terms of cognitive demand, the MYP and the reformed GCSE can be considered comparable although the ways in which they place demand on students differ at times.

Item demand and mark schemes

Overall, the study found clear similarities in the level, range and type of skills assessed by the MYP and the GCSE. The GCSE assesses at two tiers in mathematics and science—Foundation (low, low-medium or medium demand) and Higher (medium, medium-high or high demand). In the MYP, all students are assessed at the same level (medium to high demand). As a result, similarities were most evident when comparing the MYP and GCSE Higher tier examinations. The MYP and GCSE mark schemes—while applying generally similar approaches—differ in how they categorize marks.

Volume of assessment

Differences, where they exist, primarily relate to the volume of assessment per subject. This is largely a reflection of the differing structure of the two qualifications: the MYP is a composite baccalaureate-style award where students take additional and inter-disciplinary assessments, and the GCSE is a single-subject qualification. MYP subjects are each assessed through a single two-hour examination, while the GCSE has multiple examinations.

English

Objectives and skills

The assessment objectives for English vary considerably. The MYP includes four different skills (analysing, organizing, producing text, and using language, all weighted equally), and the GCSE comprises nine different areas, divided into reading and writing (weighted at 50% each) and spoken language (unweighted). Nevertheless, review of the assessment objectives found that the MYP and GCSE English courses assess a comparable range of knowledge and skills. In particular, both courses aim to assess students' ability to:

- identify explicit and implicit information
- summarize and synthesize, drawing on multiple texts
- analyse texts for content, language, technique and the author's perspective
- organize ideas and opinions in a coherent manner
- produce creative and/or insightful texts
- employ appropriate vocabulary, style, register and techniques to convey meaning to the intended audience
- use English appropriately (vocabulary, linguistic conventions, grammatical terminology).

Volume of assessment

Both qualifications use externally assessed examinations although these are of differing duration. The MYP examination for language and literature takes two hours while the GCSE has two English examinations which together take up to four hours. Similarly, for the GCSE programme, the number of marks is double those available in the MYP. Similarities were found in the number and type of questions, relative to the amount of time available for assessing each qualification.

Question types and input texts

MYP and GCSE assessments both use short answer and extended answer questions designed to test comprehension, evaluate author purpose, and produce both transactional and creative writing responses based on stimuli. Additionally, both assessments employ a range of input texts, drawn from fiction and non-fiction texts, with a greater emphasis on the latter. The complexity of input texts was similarly high in the two qualifications although the topics were very different, with the MYP containing more abstract topics.

Cognitive demand

Overall, the GCSE examinations had questions across all five levels of cognitive demand[2]. Questions situated early in the examination were generally low or low-medium demand, and questions towards the end of the examination were medium-high or high demand. This scaffolding through question progression was also seen in the MYP, however, none of the questions were considered to be low demand and later questions were primarily considered high demand. Where questions were identified as high demand in the MYP, this was typically a reflection of the level of abstractness or complexity.

[2]Low, low-medium, medium, medium-high, high.

Mark schemes

Across both qualifications, an increase in demand correlated to an increase in allocated marks. A key difference in approach is the MYP's use of a cap, limiting the number of marks awarded where a particular aspect of the task is missing in the student's response. This is linked to task response and is not an explicit feature of the GCSE mark scheme, reflecting the "compensatory" approach to marking (Ofqual 2017)[3].

Mathematics

Objectives and skills

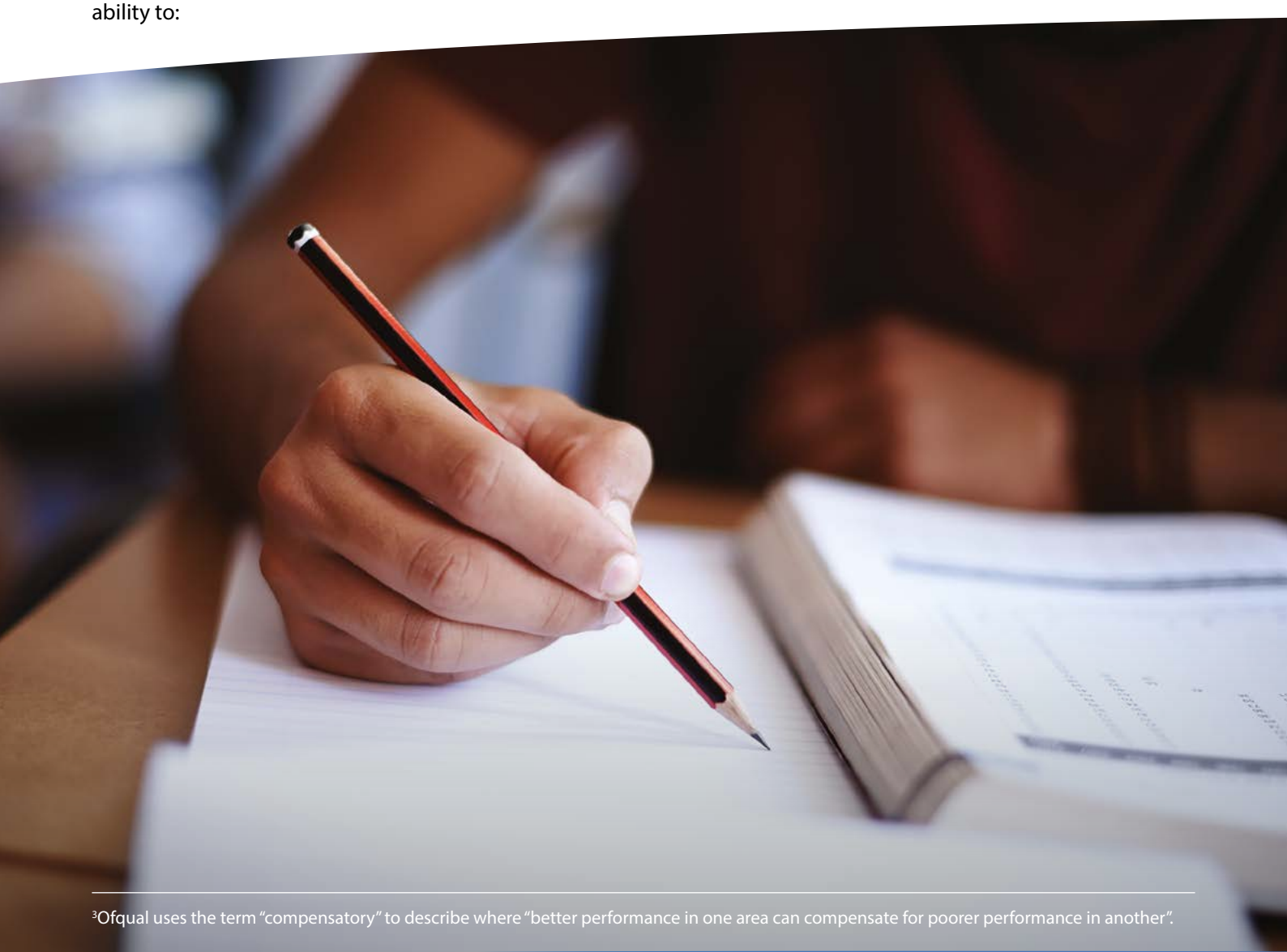
The MYP and GCSE mathematics courses have many shared aims, seeking to develop understanding of mathematical concepts, principles and methods as well as problem-solving, reasoning and communication skills. The MYP also aims to develop students' ability to reflect on their own work and on the work of others.

The MYP and GCSE assessments aim to develop a comparable set of skills—both seek to assess students' ability to:

- select appropriate mathematical techniques to solve problems
- apply and perform routine and complex procedures in different contexts
- construct chains of logical reasoning and arguments (including proofs)
- use appropriate mathematical language (notation, symbols and terminology) and appropriate forms of mathematical representation to present information
- translate problems in mathematical or non-mathematical contexts into a process or processes and solve these problems
- assess and justify the validity and accuracy of arguments, assumptions and solutions.

Volume of assessment

Both the MYP and GCSE employ external summative assessment although the overall duration differs. The MYP comprises a single two-hour examination, and the GCSE includes three examinations, with a combined duration of four hours and thirty minutes.



[3]Ofqual uses the term "compensatory" to describe where "better performance in one area can compensate for poorer performance in another".

Cognitive demand

Reviewers rated many of the GCSE Foundation questions to be low, low-medium and medium demand, and the GCSE Higher questions to be medium, medium-high or high demand. In the MYP, both standard and extended[4] mathematics questions, were generally considered to be medium, medium-high or high-demand. More in-depth analysis of selected questions found that in geometry, the MYP and GCSE questions reviewed were considered high demand in terms of complexity, resources, abstractness and strategy. Differences could be seen in questions for probability and algebra, with the MYP algebra questions deemed high demand across all aspects of the CRAS framework, and medium demand for the probability questions. The selected GCSE questions in these two topics were considered medium-high demand across four of the five aspects of cognitive demand.

Question type, scope and focus

In terms of question type, both the GCSE and MYP examinations include a mixture of short answer, and structured multi-part questions, which typically increase in difficulty throughout the examination. In the GCSE, structured questions are generally shorter and there are more standalone questions, allowing for a greater breadth of topic coverage. The MYP typically covers a slightly narrower breadth of topics but assesses certain topics in greater depth than the GCSE. Compared to the GCSE examinations, the MYP places more emphasis on investigative mathematics and the ability to analyse mathematical information and produce a written response.

Mark schemes

The mark schemes employ similar marking approaches, with marks available for accuracy and workings. Both the MYP and GCSE award some accuracy marks which are independent, and others which are dependent on students showing their work (method marks). The GCSE has marks clearly denoted as method, process, accuracy, unconditional accuracy and communication, making it clear the percentage of marks available for each. In comparison, the MYP does not differentiate marks so explicitly.

Sciences

When investigating assessment frameworks and demand in science, this study compared the MYP sciences course with the GCSE combined science course, and also examined physics as a standalone subject in both qualifications. More information about these comparisons is provided in the subsequent sections.

Objectives and skills

The MYP and GCSE assessment frameworks are similar for science, with both qualifications assessing knowledge and understanding, and the ability to apply it, particularly in designing and conducting experiments.

Both programmes seek to assess students':

- knowledge and understanding of scientific ideas, terminology, techniques and procedures
- interpretation and evaluation skills to make judgments and draw conclusions
- ability to evaluate the validity of hypotheses and methods and suggest ways to improve methods.

Integrated/combined sciences

Assessment methods and volume

Both the MYP and GCSE utilize external examinations at the end of the programme to assess the content taught throughout the course. The GCSE Combined Science course is a double award worth two GCSEs. In the GCSE Combined Science course, students can choose to take either Foundation or Higher examinations. Comparatively, in the MYP, the eAssessment is taken by all students. The MYP sciences assessment takes two hours and the GCSE combined science includes four examinations of one hour and forty-five minutes each.

Question type and scope

The MYP and GCSE use similar question types, including short answer, long answer, extended response and multiple-choice questions. The GCSE also includes gap-fill and matching questions while the MYP includes selected response questions. The GCSE examinations have greater breadth of topic coverage than the MYP examination.

[4]The MYP offers standard and extended mathematics. The extended mathematics course covers greater depth and breadth of content in comparison to the standard option. Students intending to study higher level mathematics would typically take the extended course. The extended course has more study hours than the standard course, although the assessment objectives for both options are the same.

Cognitive demand

Using the CRAS framework, analysis of selected structured questions found the MYP and GCSE science assessments to be similarly challenging. For most topics, reviewers found the questions in the GCSE Foundation examination to be of lower demand (low to medium demand). GCSE Higher and MYP examinations were mostly considered to be of medium-high demand. Lastly, the level of demand in terms of complexity, task and answer strategy was also comparable for the GCSE and MYP examinations.

Resources

Similar resources are made available to students in both qualifications, such as access to a formula/equation sheet or calculator. The GCSE and MYP examinations both include data tables, graphs and diagrams, upon which questions are based. The MYP examination also includes videos, animations and simulations, which assess the ability of students to interpret the scenario described.

Physics

Assessment methods and volume

MYP and GCSE physics are both assessed through external examinations at the end of the programme. MYP physics is assessed through one two-hour on-screen examination while the GCSE examination has two tiers (Foundation and Higher). The GCSE Foundation and Higher tiers have two examinations each, where the duration for each examination is one hour and forty-five minutes.

Question type and scope

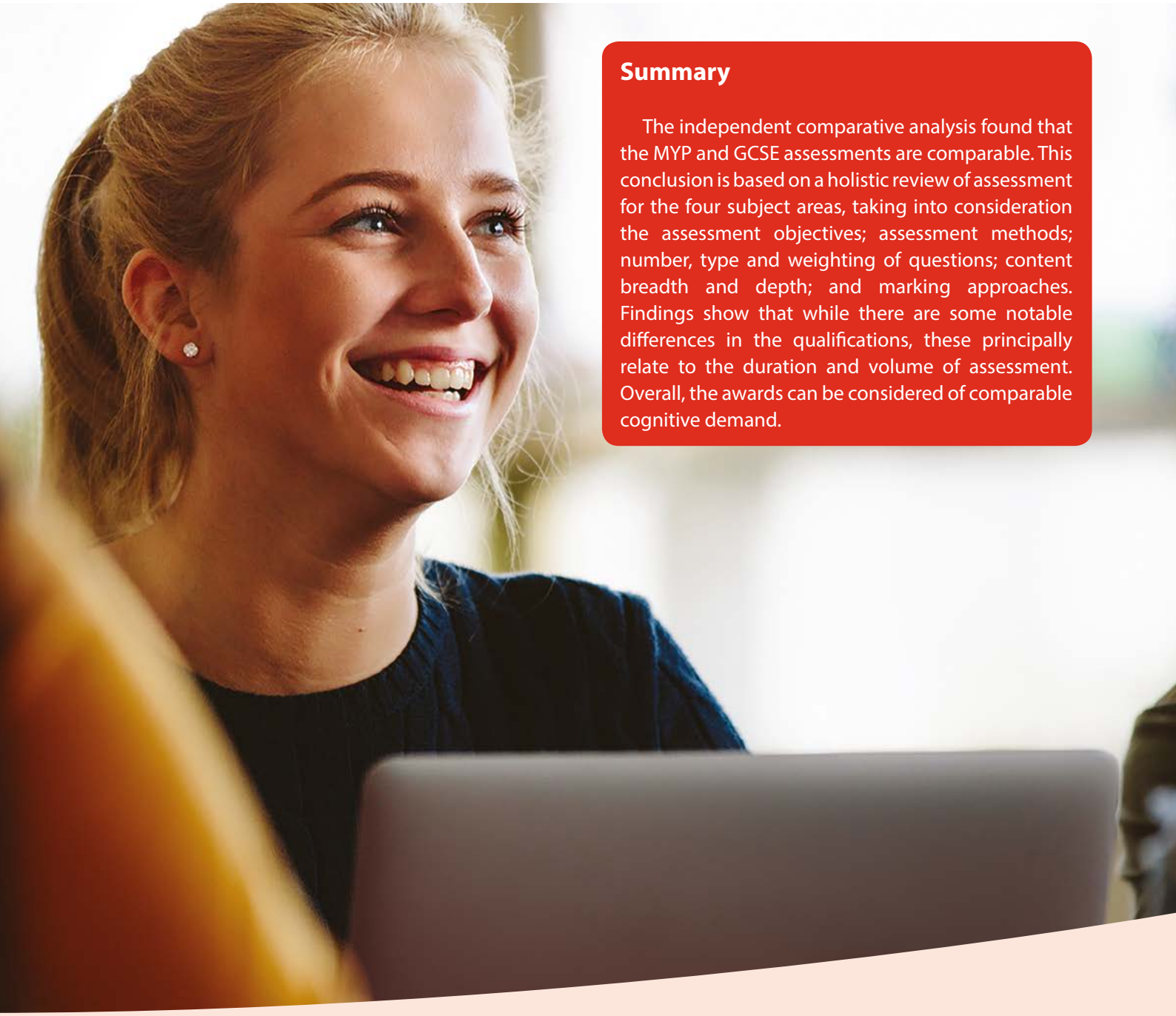
There are broad similarities in the question types used by both programmes—these include multiple choice, matching, short answer and extended response questions. Both MYP and GCSE physics examinations consist mainly of multi-part questions with a few standalone extended response questions. The GCSE examinations additionally include long answers and gap-fill questions while the MYP assessment includes selected response questions. The GCSE examinations have greater breadth of topic coverage than the MYP examination. However, in the papers reviewed, the MYP had greater depth of coverage in mechanics, force and energy than the GCSE examinations. For all other GCSE physics topics that are similarly assessed by the MYP, the depth of topic coverage is comparable.

Cognitive demand

For the GCSE Foundation level physics assessments, reviewers rated questions as low or medium-low demand across all question types and topics reviewed. There was generally consensus among the reviewers in the rating of extended response questions, which for MYP physics were considered high demand, and medium-high demand in the GCSE. There was less consensus among reviewers, however, for other question types in the MYP and Higher GCSE examinations.

Resources

Both qualifications allowed for use of a calculator and access to a formula/equation sheet. Additionally, the MYP and GCSE examinations both base questions on data tables, diagrams and graphs although the MYP also includes videos, animations and simulations.



Summary

The independent comparative analysis found that the MYP and GCSE assessments are comparable. This conclusion is based on a holistic review of assessment for the four subject areas, taking into consideration the assessment objectives; assessment methods; number, type and weighting of questions; content breadth and depth; and marking approaches. Findings show that while there are some notable differences in the qualifications, these principally relate to the duration and volume of assessment. Overall, the awards can be considered of comparable cognitive demand.

References

Ofqual 2017. Mythbusting: 3 Common Misconceptions. 17 March 2017. https://ofqual.blog.gov.uk.

Pollitt, A, Ahmed, A, and Crisp, V. 2007. "The demands of examination syllabuses and question papers". In Newton, P et al. 2007. Techniques for monitoring the comparability of examination standards. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/487056/2007-comparability-exam-standards-g-chapter5.pdf